

SECTION 25 08 00.01 00

COMMISSIONING OF POWER CONTROL AND MONITORING SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

This Section includes commissioning (Cx) process requirements for all PCMS equipment, including but not limited to the following components, systems, assemblies, and equipment.

- a. Power Control and Monitoring System (PCMS) Programmable Logic Controllers (PLCs).
- b. PCMS PLC cabinets and enclosures.
- c. PCMS I/O points as defined in Section 25 10 11.01 00 POWER CONTROL AND MONITORING SYSTEM (PCMS), including, but not limited to, the following:
 - (1) Analog Output (AO) instruments and cabling.
 - (2) Analog Input (AI) instruments and cabling.
 - (3) Digital Output (DO) instruments and cabling.
 - (4) Digital Input (DI) instruments and cabling.
 - (5) Pulse Accumulator(PA)instruments and cabling.
 - (6) Data Link (DL)instruments and cabling.
 - (7) Other analog or digital inputs or outputs to the system.
- d. Data Transmission Systems (DTS) cabling and components.
- e. Human Machine Interface (HMI) terminals and Graphical User Interface (GUI) software.
- f. PCMS servers.
- g. Time distribution system.

1.2 RELATED REQUIREMENTS

Refer to Section 01 91 00.01 15 COMMISSIONING for general Cx process requirements, definition of Cx team members, and delineation of responsibilities.

Section 25 10 11.01 00 POWER CONTROL AND MONITORING SYSTEM (PCMS) for factory and site test requirements, Performance Verification Testing (PVT) and reporting, endurance testing and reporting, and training.

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by

the basic designation only.

NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA)

NECA 90 (2015) Standard for Commissioning Building
Electrical Systems

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

NETA ATS (2013) Standard for Acceptance Testing
Specifications for Electrical Power
Equipment and Systems

1.4 DEFINITIONS

1.4.1 BoD

Basis-of-Design Document, as defined in Section 01 91 00.01 15
COMMISSIONING.

1.4.2 Cx

Commissioning, as defined in Section 01 91 00.01 15 COMMISSIONING.

1.4.3 CxA

Commissioning Authority, as defined in Section 01 91 00.01 15
COMMISSIONING.

1.4.4 CxC

AM#9...Commissioning Specialist for Construction...**AM#9**, as defined in
Section 01 91 00.01 15 COMMISSIONING.

1.4.5 CxG

USACE Commissioning Specialist, as defined in Section 01 91 00.01 15
COMMISSIONING.

1.4.6 CCR

Contractor's Commissioning Representative, as defined in Section
01 91 00.01 15 COMMISSIONING.

1.4.7 Low Voltage

600 V and below.

1.4.8 Medium Voltage

601 V and above.

1.4.9 High Voltage

69,001 V and above.

1.4.10 OPR

Owner's Project Requirements , as defined in Section 01 91 00.01 15

COMMISSIONING.

1.4.11 Systems, Assemblies, Subsystems, Equipment, and Components

Where these terms are used together or separately, they shall mean "as-built" systems, assemblies, subsystems, equipment, and components.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submittals with an "S" designation following the "G" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29.01 00 SUSTAINABILITY REPORTING. Other designations following the "G" designation identify the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00.01 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Construction Checklists; G

SD-06 Test Reports

Construction Checklist Review; G, CBJM

SD-07 Certificates

Testing Equipment and Instrumentation
Equipment Manufacturers' Proprietary Instrumentation and Tools

1.6 CONSTRUCTION CHECKLISTS

Draft construction checklists created by CxA will be provided for Contractor review prior to creation and distribution of the final Construction Checklists. Final versions will incorporate Contractor comments and information on approved submittals.

Provide comments to the material, installation, and performance test checklists for systems, assemblies, subsystems, equipment, and components to be part of the Cx process and according to requirements in Section 01 91 00.01 15 COMMISSIONING.

Construction Checklists shall include, but are not limited to, installation checks, startup, performance verification tests, endurance tests, and performance test demonstrations as described in the following:

- a. Equipment testing and inspection procedures, not including optional tests, described in NETA ATS.
- b. Equipment verification, pre-functional, and functional performance tests described in NECA 90.
- c. Section 25 10 11.01 00 POWER CONTROL AND MONITORING SYSTEM (PCMS) performance verification and acceptance tests.

1.7 QUALITY ASSURANCE

1.7.1 Testing Equipment and Instrumentation Quality and Calibration

Testing equipment and instrumentation shall be:

- a. Capable of testing and measuring performance within the specified acceptance criteria.
- b. Calibrated at manufacturer's recommended intervals with current calibration tags permanently affixed to the instrument being used.
- c. Maintained in good repair and operating condition throughout duration of use on Project.
- d. Recalibrated/repaired if dropped or damaged in any way since last calibrated.

Submit a list of test equipment and instrumentation. For each piece of equipment or instrument, identify the following:

- a. Equipment/instrument identification number.
- b. Planned Cx application or use.
- c. Manufacturer, make, model, and serial number.
- d. Calibration history, including certificates from agencies that calibrate the equipment and instrumentation.

1.7.1.1 Equipment Manufacturers' Proprietary Instrumentation and Tools

For each instrument or tool, identify the following:

- (1) Instrument or tool identification number.
- (2) Equipment schedule designation of equipment for which the instrument or tool is required.
- (3) Manufacturer, make, model, and serial number.
- (4) Calibration history, including certificates from agencies that calibrate the instrument or tool, where appropriate.

Include a separate list of proprietary test instrumentation and tools in operation and maintenance manuals.

Electrical proprietary test instrumentation and tools become property of the Government at the time of Substantial Completion.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 CONSTRUCTION CHECKLIST REVIEW

Review and provide written comments on draft construction checklists. CxA

will create required draft construction checklists and provide them to Contractor. Return draft construction checklist review comments within 10 days of receipt.

When review comments have been resolved, the CxA will provide final construction checklists, marked "Approved for Use, (date)." Use only construction checklists marked "Approved for Use, (date)."

3.2 COMMISSIONING TESTING PREPARATION

Certify that PCMS systems, subsystems, and equipment have been installed, calibrated, and started and that they are operating according to the Contract Documents and approved shop drawings and submittals.

Certify that PCMS instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents and approved shop drawings and submittals, and that pretest set points have been recorded.

Set systems, subsystems, and equipment into operating mode to be tested according to approved test procedures (for example, normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency, and alarm conditions).

3.3 COMMISSIONING TEST CONDITIONS

Perform tests using design conditions, whenever possible. Simulated conditions may, with approval of the Contracting Officer, be imposed using an artificial load when it is impractical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by CxA and document simulated conditions and methods of simulation.

After tests, return configurations and settings to normal operating conditions. Cx test procedures may direct that set points be altered when simulating conditions is impractical. Cx test procedures may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are impractical.

If tests cannot be completed because of a deficiency outside the scope of the electrical system, document the deficiency and report it to the Contracting Officer. After deficiencies are resolved, reschedule tests.

If seasonal testing is specified, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.4 COMMISSIONING TESTS FOR PCMS SYSTEMS

Measure capacities and effectiveness of systems, assemblies, subsystems, equipment, and components, including operational and control functions, to verify compliance with acceptance criteria.

Test systems, assemblies, subsystems, equipment, and components operating modes, interlocks, control responses, responses to abnormal or emergency conditions, and response according to acceptance criteria.

Coordinate schedule with, and perform Cx activities at the direction of, CxG.

Comply with construction checklist requirements, including material verification, installation checks, startup, performance verification, and endurance requirements specified in Section 25 10 11.01 00 POWER CONTROL AND MONITORING SYSTEM (PCMS).

Provide technicians, instrumentation, tools, and equipment to perform and document the following:

- a. Construction checklist verification tests.
- b. Construction checklist verification test demonstrations.
- c. Cx functional tests.
- d. Cx functional test demonstrations.

3.4.1 Verification of PCMS Operation

Prerequisites	
	Acceptance of results of acceptance test reports specified in Section 25 10 11.01 00 POWER CONTROL AND MONITORING SYSTEM (PCMS) for components and systems to be tested.
Components and Systems To Be Tested	
	All PCMS equipment and cabinets, including but not limited to PLCs, I/O instruments and cabling, PCMS HMI terminals, and software GUIs.
Test Purpose	
	Verify operation of power control and monitoring systems for all integrated systems.
Test Conditions	
	Energize components of system.
	Test operation of equipment.
Acceptance Criteria	
	Successful completion of all tests and verifications required by SECTION 25 10 11.01 00 POWER CONTROL AND MONITORING SYSTEM (PCMS) and Electrical Cx Construction Checklist and Functional Performance Tests.

3.4.1.1 PCMS System Training Requirements

Contractor shall provide minimum six hours of training in accordance with Section 01 78 23.01 00 OPERATION AND MAINTENANCE DATA and Section 01 91 00.01 15 COMMISSIONING, in addition to any special training requirements listed in Section 25 10 11.01 00 POWER CONTROL AND MONITORING SYSTEM (PCMS).

AM#9

READY TO ADVERTISE
LRDR Construction Package #1 - Clear AFS, Alaska

CLR039a

-- End of Section --